

SGD001-P06

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## Kashima RAY-Tracing Service: KARATS

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Radio signal delays associated with the neutral atmosphere are one of the major error sources of space geodesy such as GPS, GLONASS, GALILEO, VLBI, In-SAR measurements. We have developed a state-of-art tool to estimate the atmospheric path delays by ray-tracing through JMA meso-scale analysis (MANAL data) data. The tools, which we have named 'Kashima RAYtracing Tools (KARAT)', are capable of calculating total slant delays and ray-bending angles considering real atmospheric phenomena. Numerical weather models such as MANAL data have undergone a significant improvement of accuracy and spatial resolution, which makes it feasible to utilize them for the correction of atmosphere excess path delays. In the previous studies for evaluating KARAT performance, the KARAT solutions are slightly better than the solutions using VMF1 and GMF with linear gradient model for horizontal and height positions. Based on these results we have started the web-based online service, 'Kashima RAYtracing Service (KARATS)' for providing the atmospheric delay correction of RINEX files on Jan 27th, 2010. The KARATS receives user's RINEX data via a proper web site (<http://vps.nict.go.jp/karats/index.html>) and processes user's data files using KARAT for reducing atmospheric slant delays. The reduced RINEX files are archived in the specific directory for each user on the KARATS server. Once the processing is finished the information of data archive is sent privately via email to each user. If user want to process a large amount of data files, user can prepare own server which archives them. The KARATS can get these files from the user's server using GNU wget and performs ray-traced corrections. We will present a brief status of the KARATS and summarize first experiences gained after this service went operational in December 2009. In addition, we will also demonstrate the newest KARAT performance based on the 5km MANAL data which has been operational from April 7th, 2009 and an outlook on future developments of KARATS.

Keywords: atmospheric path delay, ray tracing, GNSS, VLBI, online service